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ABSTRACT

Teacher education is defined as sets of activities deliberately intended to socialize candidates into the occupation of teaching. Nine broad categories of variables, referred to as the parameters of teacher education are proposed and defined. These include: (1) the goals, (2) characteristics of the candidates, (3) characteristics of the staff, (4) content of the program, (5) time and its allocation, (6) the ethos of the program, (7) location and setting, (8) regulations, and (9) financial resources and restraints. These parameters are then displayed in a nine-by-nine matrix generating nine diagonal within-parameter cells, and 72 intersecting cells which can "contain" summaries, analyses and syntheses of the available research on the variables within the parameters. In addition, some examples of how the matrix can be used to generate new research questions are presented. (Author/MP)

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A Matrix for Research on Teacher Education

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Summary

Teacher education is defined as sets of activities deliberately intended to socialize candidates into the occupation of teaching. Nine broad categories of variables, referred to as the parameters of teacher education are proposed and defined. These include: (I) the goals, (II) characteristics of the candidates, (III) characteristics of the staff, (IV) content of the program, (V) time and its allocation, (VI) the ethos of the program, (VII) location and setting, (VIII) regulations, and (IX) financial resources and restraints. These parameters are then displayed in a nine-by-nine matrix generating nine diagonal within-parameter cells, and seventy-two intersecting cells which can "contain" summaries, analyses and syntheses of the available research on the variables within the parameters. In addition, some examples of how the matrix can be used to generate new research questions are presented.

A Matrix for Research on Teacher Education

It comes as no surprise to note that we begin the nineteen eighties with a large literature on teacher education. A simple scan of the ERIC* document holdings, for example, indicates that we enter the new decade with eight thousand document and almost six thousand journal citations from this one source alone.

The purpose of this chapter is to present a definition of teacher education and its parameters from which a matrix can be developed. Some examples of how the matrix can be used to organize, analyze and synthesize the available literature and to generate new research questions are presented.

DEFINITION OF TEACHER EDUCATION

Common sense tells us that teacher education is whatever happens in programs and on courses in institutes, colleges and universities engaged in teacher training! A little more common sense holds that if we just knew more, and furthermore tried harder, great teachers would emerge from these institutions. This error of oversimplification made by 'outsiders' is compounded by the tendency of 'insiders' to confuse the study of teacher education with the study of teaching. Discussions among the latter quickly turn to correlations between teacher behavior and pupil achievement. While such correlations are of inter-

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* The acronym ERIC stands for Educational Resources Information Center, a national network of centers funded by the National Institute of Education of the United States Department of Health, Education and Welfare holding more than 160,000 documents on microfiche, with computerized bibliographic searching capability.

est to teacher educators, they tend to detract from examination of the determinants of teacher education, and the complex ways those determinants interact.

For the purposes of this chapter, teacher education is taken to be a special case of the more general case of professional or occupational socialization. As Moore defines it, professional socialization "involves acquiring the requisite knowledge and also the sense of occupational norms typical of the fully qualified practitioner" (Moore, 1970:71). It can be assumed, then, that the function of a teacher education program is to provide those experiences which can be expected to facilitate the acquisition of the skills, knowledge, etc. of the group into which candidates are to be socialized. This function yields the following definition of teacher education:

> teacher education consists of sets of events and activities which are deliberately intended to help candidates to acquire the skills, dispositions, knowledge, habits, attitudes, values, norms, etc. which enable them to enter the occupation of teaching.

The potential sets of events and activities which could constitute teacher education programs or courses are numerous and varied. They may include for example lecture classes, excursions and field trips, a variety of practica, modules on specific topics, microteaching, observations of children and teachers, workshops in arts and crafts, independent reading, tutoring of individual children, and so forth. This variety of activities is in turn affected and determined by broad classes of variables we shall call here parameters, which are outlined

below.

PARAMETERS OF TEACHER EDUCATION

For the purpose of this discussion, the term parameter is used to describe a broad category of variables of which every teacher education program or course can be said to have a case, or an entry, and which remains relatively constant throughout a given candidate's participation in the program.

Although the parameters are ennumerated below as a list of discrete classes of variables, experience suggests that they represent complex interacting and confounding forces, separated here so as to facilitate ordering of the literature and to encourage discussion and enquiry. Neither the order of importance of these parameters, nor their relative impacts on the activities or outcomes of teacher education is known at this time. Nine parameters are defined briefly as follows:

I Goals

This parameter includes the aims, goals and objectives the events and activities of teacher education are intended to achieve. Included in this parameter also are the methods used to assess the extent to which the goals are reached.

II Candidates

This parameter includes such characteristics of the candidates as age, sex, socio-economic status, motivation, intellectual ability, creativity, ethnicity, and any other characteristics which can

be thought to be related to the nature and outcome of the teacher education program.

III Staff

This parameter includes such characteristics of the staff as age, experience, skill, ideological commitment, ethnicity, specialization, and so forth. Staff members are all those whose assignments include activities deliberately intended to help the candidates' induction into the occupation. Among them are senior professors, lecturers, graduate teaching assistants, adjunct professors, cooperating teachers, counselors, advisors, principals, heads, teachers' center wardens, and so forth.

IV Content

This parameter includes the facts, information, skills, competencies, ideas, techniques, philosophical principles, academic disciplines, etc. transmitted to the candidates via the activities and events constituting the teacher education program.

V Time

This parameter includes the duration of the program i.e. one, two or three or more years; it includes also timing and sequencing or temporal order as well as simultaneity of the events and activities constituting the teacher education program.

VI Ethos

This parameter refers to the intellectual and social climate or atmosphere of the program; the ethos of the setting is reflected in the affective tone and content of the interpersonal relationships between and among the candidates and staff members.

VII Location

The location of a teacher education program may be a conventional college campus site, an urban commuter campus, a teachers' center, community college, polytechnic or monotechic, demonstration school or campus laboratory school, etc.

VIII Regulations

This parameter includes the laws, regulations, legal restrictions and stipulations related to teacher education and certification as well as the requirements of labor or trades unions, school districts, local educational authorities, regional and national regulations, edicts of boards of trustees, or governors or other authorizing bodies who have power over the activities and events constituting teacher education.

IX Finances

This parameter includes variables related to the costs of teacher education, including capital and personnel costs, candidates' tuition fees and living expenses and

anticipated financial rewards of teaching, etc.

It is assumed here that every instance of a teacher education program has entries in the variables within each of the nine parameters defined above. The ways in which the variable values in each of them contributes to the ultimate kinds of experiences available to candidates remains to be ascertained.

A matrix showing how these parameters can be used to organize the existing relevant literature and to generate questions for further research follows.

A MATRIX FOR TEACHER EDUCATION

In Figure 1. the nine parameters that affect and determine teacher

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Insert Figure 1. about here

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education are presented as a matrix. The shaded cells in the diagonal created by the matrix indicate potential summaries of the literature and research on within-parameter variables. For example, the first cell in the upper left-hand corner of the matrix marked: 1, would "contain" a summary of all that is known about aims, goals and objectives of teacher education. It could also "contain" summaries of the available knowledge on specific sub-topics within the parameter. Much of the data summarized in the diagonal cells can be expected to come from surveys, as well as from experimental research. In this way, each cell in the diagonal represents a state-of-the-art report on the particular parameter or on any of the sub-topics within it. Some examples of the types of topics and questions to be addressed in each diagonal cell and a few

of the intersecting cells are presented below.

Research on Goals

In the cell marked "I", summary, analysis and synthesis of the literature pertaining to goals and objectives as well as their assessments are located. The data might be derived from surveys for example, and could be analyzed in terms of their explicitness, coherence, ideological assumptions, changes over time, within-program consistency or compatibility and so forth. In addition, the potential relationships between goals and objectives and the methods of assessment used can be summarized in this cell. The number of potential sub-topics in this parameter is large.

One illustrative example of a topic which falls into this cell is performance or competency-based teacher education. One of the problems of interest is the extent to which competency-based teacher education leads to a reductionist conception of the nature of teaching, and hence of teacher education (See Merrow, 1975). Pressure to specify "demonstrable" skills as the desired outcomes of training could, although not necessarily, result in the formulation of long lists of discrete skills. These would be small units of action, each of which could be observed and evaluated separately involving the assessor in very minimal inference as to the presence or absence of the skill of interest. This approach to both the goals and the assessment of candidates in teacher education implies that teaching consists of an aggregate of separable skills, an implication also embedded in much of the available research on training as well.

While teaching certainly includes skills and other small units of

action, it is more useful to think of teaching in terms of larger patterns of behavior, including the ability to decide which skills to use and when to use them. It may be that the effects a teacher has derive not from her* behavior per se, but from the total or overall pattern of which a given learner perceives that behavior to be a part. Episodes of teacher behavior can be compared to words in sentences: it is the sentence that gives the word its meaning. If teachers or candidates are evaluated on the basis of checklists of discrete demonstrable skills, there is danger that the really powerful aspect of teaching, namely the meaning individual learners assign to teachers' behaviors, will be neglected. It may be that individual children assign meanings to teacher behavior that observers may either define differently, or do not even recognize. Isolated or quick judgements can be made about the presence or absence of a given behavior, but not about the probable meaning individual children might give to that behavior. While the goals of competency-based teacher education programs might be to equip candidates with a repertoire of "beginner's" skills, they may inadvertently overlook some of the larger concerns of socialization into the profession.

The potential risks of competency-based assessment (as well as goal orientation) in teacher education must be weighed against the risks of alternative approaches. One of the most common practices in assessment of teacher education is reliance on grades obtained in classes and examinations. Combinations of class grades, state or national examinations are used in some institutions and some countries. These assess-

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* The feminine gender is used for convenience.

ment techniques tend to make the error of inducting into the profession those who are good at being "students" in its narrowest sense. The extent to which the latter is associated with success at teaching is not clear.

Some institutions place great reliance on the evaluations of the supervisors of the practica and internships. While the bases upon which such assessments are made are likely to have greater 'content' validity than grades or exams, they are apt to be susceptible to vicissitudes of candidate-cooperating teacher relations and other aspects of the practicum or internship site.

It is very likely that every assessment technique employed produces errors. Combinations of assessment procedures (e.g. performance criteria, plus class grades, plus personal interviews, plus supervisors' ratings) may help to counterbalance the errors inherent in each technique, or may compound them. Even if multiple assessments could be shown to counterbalance the errors, their costs (Parameter IX: Finances) would make such combinations impractical.

Assessing the outcomes of teacher education seems to be a question of which errors we prefer to make. An error-free strategy is not likely to be found. Summaries of research on the stability, reliabilities or predictive validity of each of many assessment techniques used in teacher education programs would belong in this cell.

Research on Candidates

In the cell on the diagonal marked II, summaries of studies of characteristics of candidates would be placed. Of all of the potential characteristics of interest, socio-economic status and attitudes have probably received the greatest proportion of researchers' attention (See Turner, 1975). Summaries of research on such other candidate

characteristics as intelligence, creativity, role-taking ability might also be useful in understanding the nature of teacher education programs.

If we now go across the row labeled II: Candidates, to the cell under column III; Staff, (II x III), we arrive at the cell in which we summarize available data concerning interactions and/or effects of selected candidate characteristics upon selected characteristics of the staff. Questions concerning candidates' evaluations of their instructors, and how the publication of the results affect the staff and the content (Parameter IV) offered in the teacher education program would be the type of questions belonging in this cell.

Research on Staff

The number of potential questions concerning characteristics of the staffs of teacher education programs is very large, and it is difficult to know which of them might contribute most powerfully to the constituent activities of the program.

A popular view in need of empirical testing is that teacher educators' effectiveness is related to the amount as well as recency of their own first-hand school teaching experience. The relationship between success as a classroom teacher of children and as a teacher of teachers is not known at present. Similarly there is some sentiment to the effect that staff members who are interested in research and theory are less effective in their roles as teacher educators than those who are more fully devoted to their teaching responsibilities. Data bearing upon these "myths" could be very useful.

General impressions suggest that staff members themselves suffer from low morale, and generalized cynicism toward their own role in the improvement of the teaching profession.

Career patterns of teacher education staffs might also be of value in accounting for the nature of teacher education. It would be of some interest to know for example whether there are reliable attributes of teacher educators which distinguish them from the school teaching colleagues they left behind. It may be that those who left classroom teaching are more energetic or intellectually curious than their former colleagues. How such distinguishing characteristics might impinge upon the nature of teacher education and its effectiveness is open to speculation.

If we now go across the row labeled III: Staff, to the cell in column II: Candidates, (III x II) we can ask questions concerning the ways staff characteristics impinge or interact with selected candidate characteristics.

It would be of interest to know, for example, in what ways staff members can and/or actually do serve as models for the candidates. Let us suppose, for example, that staff members were asked to enumerate a list of "professional" attributes they wish to foster in candidates. To what extent would candidates perceive the same attributes in staff members? General impressions suggest that candidates perceive professorial staff members for instance to be impractical and too removed from the realities of day-to-day work in schoolrooms. Another question concerns how candidates perceive their teacher education instructors' intellectual competence compared to their instructors in classes outside of education (e.g. psychology, English literature, natural science, etc.). What might be the effects of the relative standings of teacher educators and non-education instructors on the processes of occupational socialization? These are examples of

the types of questions that belong in this cell.

Research on Content

A survey of teacher education programs is likely to indicate agreement concerning appropriate content. With slight variations most programs provide candidates with a mixture of foundations (philosophy and history of education, educational psychology, etc.), child development, teaching methods classes, field experiences, observation of children and teachers, and so forth. The relative contributions of all or each of these types of content to the outcome of the program are not clear.

There appears to be general agreement on the usefulness of practica, but they are not without problems. In many communities opportunities to observe "good" practices, and in fact to practice or rehearse them are in short supply. Sometimes candidates complain of having to engage in teaching practices that their teacher educators reject or deplore.

It is not really clear what candidates learn from such experiences. Often their responses to "bad" placements can be broadly typed as excessive idealism or excessive realism (See Katz, 1974). The truism that "practice makes perfect" overlooks the fact that only "good" practice is related to "good" learning. If candidates can indeed learn what is desired from rehearsing "bad" practices in "bad" field settings, then there need be no undue concern about the quality of teaching observed.

If we now go along the row marked IV: Content, to the column marked V: Time, (IV x V) we come to the cell in which questions concerning which types of content might be provided for candidates at which particular points in the period of preparation. For example there are

currently strong pressures for practica to be offered earlier rather than later in the sequence of activities of a program. One strong argument in favor of early practica is that they provide candidates with opportunities to "try on" the teacher role and to make an informed career choice prior to the completion of a large portion of their required work. Another argument is that simultaneous as well as subsequent course work acquires greater relevance when such "trying on" of the teacher role as well as the exercise of teaching techniques has occurred. No evidence to support these arguments has been found.

Research on Time

The activities that constitute a teacher education program vary as to the total period of time in which they occur and with respect to the point in time during that period when they occur. In addition, there may also be variations as to the order, sequence and simultaneity of the events and activities.

In academic institutions the concept of "residency" implies that candidates acquire valuable assets from the continuous and intensive contact with the staff and other candidates in the setting. Obviously since all events occur in time, the duration of both residency and candidacy affect the number of opportunities to engage in given activities.

If we now go to the row marked V: Time, to the cell in the column marked II: Candidates, (V x II) we can examine the research now accumulating concerning the developmental stages of candidates as well as teachers. This research (e.g. Fuller and Bown, 1974; Heath, n.d.) suggests that developmental tasks and concerns vary as candidates progress through the activities and experiences provided by the program. Among the many

attributes of candidates which may have developmental properties are those related to the candidate's understandings or conceptions of teaching. It seems reasonable that these understandings develop as experience, knowledge and practice accrue. Early in candidacy the understandings of teaching may consist largely of perceptions of what activities occur in classrooms, and simple stereotypes of children and teaching situations. It seems reasonable to predict that candidates' understandings of what teaching involves would be less finely and fully differentiated earlier in their careers than they become later on. The differentiation could be expected to increase in such attributes as the number of levels of analysis, the conceptions or constructions of teaching situations, attributions of the causes of children's behavior and so forth.

Research on Ethos

Ethos, somewhat like social climate, may be defined as the affective tone which characterizes the feelings generated by the total sets of relationships within a given socialization setting (Wheeler, 1966). Thus the ethos of a given teacher education program might be characterized as "warm, friendly, relaxed and humanistic, or cold, unfriendly, efficient, etc."

If we go along the row marked VI Ethos, to the cell in the column marked II: Candidates, (VI x II) we can ask questions about how the ethos of a setting might affect candidates.

To the extent that the content of the relationships within the setting consist of intellectual and professionally relevant matters, the ethos is likely to be a serious as well as stimulating one. When the content of relationships tends to consist of personal and mundane mat-

ters, the ethos is unlikely to strengthen or support intellectual vitality in either the candidates or the staff.

One of the factors affecting the ethos of a socialization setting is its size. As the numbers of candidates and staff increase, the ability of the staff to create and maintain a given ethos may decrease and regimentation or bureaucratization may increase. There may of course be an optimum size such that too small a program yields problems of over-intimacy, insufficient variety of participants at candidate and staff levels, and deficiencies in resources. On the other hand, general impressions suggest that the larger a teacher education setting is, the more the ethos resembles (by analogy) a 'cafeteria' rather than a 'dining room'. In the cafeteria ethos, the feeling tone is apt to be flat or lacking in either social or intellectual vitality. Cafeterias seem to be low on both affective and aesthetic considerations, whereas dining rooms maximize both these qualities.

The risks of such 'cafeteria' atmospheres can be seen more clearly when compared to small charismatic institutions identified with particular leaders and/or ideologies. The small institution can be called charismatic when it has a clear ideological commitment and/or when it relies heavily on the attractiveness or persuasiveness of a charismatic leader or leadership group. Aside from the effects of ideological commitments on the ethos of the program, ideologies seem to help the staff to organize their priorities, activities and ideas, and to help candidates interpret their experiences and develop their understandings of what their future occupation will be like. Research on the ways in which the ethos of programs vary and their relative effects would be useful.

Research on Location

Teacher education occurs in a wide variety of settings and locations within countries and around the world. It is unlikely that within-parameter data would be of great interest to teacher educators. It is reasonable however to expect a number of variables in this parameter to impinge upon variables in other parameters.

One example of interest can be located in the cell created by the intersection of row VII: Location, and column III: Staff, (VII x III) in which questions concerning the impact of different settings upon staff members can be posed. For example, how does the pressure to "publish or perish" upon staff members in universities affect the content (Parameter IV) or the ethos (Parameter VI) of the teacher education program? It may be that a larger proportion of candidates' experiences in universities is provided by instructors with less training and experience (i.e. teaching assistants) than are experiences for candidates in institutes and small colleges. This suggests that universities might provide less vigorous intellectual training than the smaller institutions. On the other hand, the larger intellectual community surrounding the teacher education program in a large university might supply an ethos which more than compensates for the differences in staff qualifications. Comparative studies of such aspects of teacher training would belong in this cell.

Research on Regulations

The number and scope of regulations governing teacher education in a variety of settings appears to increase steadily. The regulations may determine the number and characteristics of candidates, qualifications of staff members, allocation of time to various types of content,

and so forth. In the U.S., teachers' unions are actively engaged in sponsoring legislation at various governmental levels which will affect teacher education programs both directly and indirectly. The recent passage of federal legislation concerning the "least restrictive environment" for the education of handicapped individuals (Public Law 92 - 142) is already having important impact upon the content, Parameter IV, (VIII x IV) of teacher education programs.

Research on Finances

Although this parameter is last on the list, variables subsumed in it are probably of primary importance to most of the variables in all of the other parameters. A check of a few of the cells across the row marked IX: Finances, will provide some examples of the pervasiveness of financial considerations.

If we take the first cell in the row marked IX: Finances, (IX x i) we can examine the relationship between the assessment procedures used in teacher education programs and the costs they might involve. For example, both interviewing and classroom observations of candidates are likely to be better predictors of professional competence than course or test grades. But the costs of such procedures mitigate against their use.

In the next cell, (IX x II), we might ask questions about how the anticipated incomes of teacher education candidates determines their level of motivation, socio-economic background and or their intellectual qualifications. How much higher would anticipated earnings have to be to change the composition of the candidate pool? Just how those characteristics impinge upon the quality of the overall teacher education program is not known.

In each of the cells in the row, questions can be posed concerning the ways in which financial resources determine the values of variables in the other eight parameters.

SUMMARY

It has been proposed in this chapter that teacher education consists of sets of activities intended to socialize candidates into the occupation of teaching. Furthermore, it has been asserted that the determinants of teacher education can be thought of as nine interacting classes of variables called parameters. The parameters have been arrayed in a matrix to show how the available literature could be summarized, analyzed and synthesized, as well as how new research questions can be generated.

The number of potential variables that can be generated in each parameter is almost limitless. The next problem becomes to be able to select those which can be expected to have the greatest power to improve our understanding of teacher education, and to guide the kind of subsequent research and development which may serve to improve it. In order to select from among this vast potential set of variables some persuasive theories concerning which variables might be related to which other ones are required. It is hoped that the ordering of available literature and the generation of new questions facilitated by the matrix will be followed by the identification of useful theories for the next steps in the development of the field.

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Parameters	I Goals	II Candidates	III Staff	IV Content	V Time	VI Ethos	VII Location	VIII Regulations	IX Finances
I. Goals	I	II x III							
II. Candidates		II		II x IV					
III. Staff		III x II	III						
IV. Content				IV	IV x V				
V. Time		V x II			V				
VI. Ethos		VI x II				VI			
VII. Location			VII x III				VII		
VIII. Regulations				VIII x IV				VIII	
IX. Finances	IX x I	IX x II							IX

Figure 1. A schematic representation of a matrix for teacher education using nine parameters.